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ABSTRACT

A model is presented for creating a community college student typology for the purpose of defining successful and unsuccessful student outcomes for each typology segment. The need for such a typology is addressed, as well as a description given of the computer techniques used to gather the baseline data upon which the typology is based, and the methodology used to generate the typology. The major portion of the study deals with the typology itself and the success criteria defined for each student type along with actual achievement percentages; these percentages are compared to the established goals assigned for each type. The typology was constructed out of two key variables: initial course load (one, two/three, or four and more) and stated intention (certificate/degree, job related, personal interest, and unsure/unknown). Contains eight references. (GLR)

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A TYPOLOGY OF COMMUNITY COLLEGE STUDENT BEHAVIORS: DEFINING STUDENT SUCCESS AND STUDENT FAILURE

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This paper was presented at the Thirtieth Annual Forum of the Association for Institutional Research held at The Galt House, Louisville, Kentucky, May 13-16, 1990. This paper was reviewed by the AIR Forum Publications Committee and was judged to be of high quality and of interest to others concerned with the research of higher education. It has therefore been selected to be included in the ERIC Collection of Forum Papers.

Jean Endo
Chair and Editor
Forum Publications Editorial
Advisory Committee

Abstract

A model for creating a community college student typology for the purpose of defining student success is presented. The need for such a typology is established. The computer techniques used to gather the baseline data upon which the typology is based as well as the methodology used to generate the typology are described. The major part of the paper deals with the typology itself and the success criteria defined for each student type. The intended audience is any higher education professional interested in student tracking, outcomes, and success.

The following work lays out in some detail the development of a typology of Dallas County Community College District (DCCCD) students which allows one to rigorously define successful and unsuccessful outcomes for each typology segment. It builds upon efforts described in a previous paper (Aquino (1989)).

Background of the Discussion

In recent years the topic of student success and student failure in community colleges has experienced renewed vigor. In large part this is due to the current nationwide interest in institutional assessment. Although an analysis of the origins and probable effects of the national assessment movement is beyond the scope of this work (for a discussion of both topics, see Advisory Committee to the College Outcomes Evaluation Program, 1987), one outcome of this movement is clear: a reexamination of the effectiveness of community colleges.

Part of this comes from community colleges' tradition of the open door. In the minds of many lay people and political leaders, a highly selective institution is *ipso facto* an excellent one, while one that is not selective, or indeed open-door, can only aspire to be mediocre. Over the years, and with varying degrees of success, community college educators have countered this myth. Indeed, the great variety of students attracted to such accessible institutions has been one of the great strengths and

unifying themes of community colleges. However, there is an even more fundamental cause of this questioning of the value of community colleges which is perhaps a natural outgrowth of the open door.

Community colleges have historically had a very low graduation and retention rate compared to their four-year counterparts. Of course, this is an unfair comparison, based on the assumption that most community college students begin their postsecondary education with the intention of earning an associate degree after two years of full-time study. By now it is well known that community colleges, in addition to addressing the needs of 18 and 19 year old full-time, degree-seeking students, also serve a wide variety of people, from displaced homemakers and workers, to people wishing to upgrade job skills, to people simply taking courses for pleasure. Clearly, the relative success of such a broad gamut of students and student intentions cannot be measured by a single yardstick. However, by community colleges' insistence on the relativity of student success they have tended to avoid confronting the issue of exactly what is meant by the term "student success" in the community college context. This issue has become especially pertinent because under the imperatives of assessment and accountability community colleges are being asked to document student success.

Of course, assessment has another side, that of institutional improvement. Within this realm an area which has received much attention as of late is that of identifying at risk students and increasing their chances of success. However, at least in community colleges, the issue is not so cut and dried.

When we speak of at risk students the implication is that the students are at risk of failing. However, if we do not have a good idea of what success in the community college is, do we have any better idea of what failure is?

Clearly, what is needed is a typology that would allow for the full range of diversity of students that one typically finds in a community college. We believe that a necessary first step in developing a typology, then, is to perform some kind of longitudinal study of student behavior. That is, we would identify a cohort of students and track them throughout their careers at the Dallas County Community Colleges. Especially in a community college environment, longitudinal studies are crucial to an understanding of student behaviors with respect to a whole series of outcomes-related and other issues (e.g., student persistence, minority achievement).

Longitudinal studies of college or post-high school students are not new (see Bers (1988); Eagle, Fitzgerald, Gifford, Zuma, and MPR Associates (1988); Sheldon (1982); Simpson (1987); Vorhees (1987)). None of the studies mentioned have explicitly dealt with issues of student typologies for the purposes of defining student success. Sheldon (1982 pp. 1-30 - 1-34) did make an attempt to classify community college students into 18 "prototypes". However, he does not propose any success model and indeed, some of his prototypes have limited applicability to such a model (e.g., "The Intercollegiate Athlete").

A first attempt at the Dallas County Community College District (DCCCD) of constructing a typology by means of a

longitudinal analysis are outlined in a previous paper (Aquino (1989)). In that work five types of community college student behavior were defined: full-time completers, part-time completers, successful non-completers, nonsuccessful non-completers, and zero credit earners. Although it was a useful first step in developing the methodological tools for this type of work, this typology suffered from two problems: a) it typed student behaviors only after the fact, i.e., five years after they first entered the DCCCD, and b) the success indicators for each type are ambiguous.

Methodological Considerations

Given the above concerns, it was decided that our student typology had to fulfill a number of conditions:

a) It must be based on data, not on a priori notions of what student behavior should be.

b) It must be value neutral. A student's belonging to one type or another must not imply any kind of value judgement of any kind. Thus, a type like "students who should not be in college" is precluded.

c) It must be manageable. This implies that there must be an upper limit on the number of types in the typology; too many types would make it unwieldy.

d) It must make intuitive sense. That is, the typology must not appear idiotic or frivolous to the deliverers of services to students.

e) It must suggest success indicators for each type.

f) It must assign students to a type as early as possible in their collegiate careers. Post hoc typologies are of no use in identifying students for special interventions. Indeed, the intention at the DCCCD was that the typology not be an academic exercise but a tool for improving student success; a typology that could not be used as such would be useless.

With these issues in mind, the committee charged with creating the typology made a number of decisions. In the first place, our general plan of attack was to see which variables had the greatest impact on student outcomes. In order to simplify our task we decided that the key outcome with respect to which we would perform our analysis was persistence; if we had to choose a single best indicator of positive student outcomes in a community college context, it would be persistence through the educational process. We also decided that the only variables which would enter into our analysis were those evident in the students' first semester. Students could then be typed in their initial semester. Finally, the committee decided that the typology would be an iterative process, subject to continual review and refinement. We knew we were breaking new ground and that our first effort would probably not be as good as subsequent ones.

The point of departure was a retrospective longitudinal study of the 13,000-odd people comprising the Fall 1986 cohort of students entering the DCCCD. These students' academic records from Fall 1986 to Fall 1988, inclusive, were frozen and analyzed.

Over the years, community college educators have evolved a fairly complex, if not internally consistent, set of categories

of students. As is most often the case, these categorizations are based on educators' impressions, prejudices, or both. Examples of these folk categories include: "the returning homemaker", "minority students", "developmental students", "vocational/occupational students", etc. We decided that we would treat these and other folk typologies as hypotheses and test the degree to which persistence behaviors cluster around each of the these variables.

The Findings

Upon analysis, a number of interesting patterns emerged and some common beliefs about community college students, at least for these at the DCCCD, were debunked. The following variables were found to have no significant correlation with persistence: income[1], gender, race/ethnicity[2], and whether or not they were graduates of the Dallas school district as opposed to more affluent suburban school districts. These variables were discarded from our model.

We then looked at persistence with respect to initial course load, whether or not the students were registered for developmental courses in their initial semester, and whether or not the students were registered in at least one technical-occupational course in their initial semester. We decided that the traditional distinction between full- and part-time students did not fully allow for subtleties of distinction among course loads. Rather, we chose a tripartite division of these students: those registered in their initial semester for one course, two to

three courses, and four plus courses. Anecdotal data suggested that there was a significant difference in motivation and needs between those part-time students who registered for a single course and those who registered for two or three courses. The distribution among these course load types is summarized in Figure 1. This distribution shows remarkable consistency over

DCCCD 1986 COHORT INITIAL COURSE LOAD

	Number	Percent
1 Course	4,150	32
2-3 Courses	4,911	38
4+ Courses	4,006	31
Total	13,067	101[3]

Fig. 1

DCCCD 1989 COHORT INITIAL COURSE LOAD

	Number	Percent
1 Course	4,204	33
2-3 Courses	4,685	37
4+ Courses	3,823	30
Total	12,712	100

Fig. 2

time as Figure 2 suggests. As can be seen, although the absolute numbers change from 1986 to 1989, the distributions are virtually identical.

When persistence is plotted out with respect to course load

and developmental and technical-occupational status some interesting patterns emerge (see Figure 3). Note that across all

PERCENTAGE OF ORIGINAL 1986 COHORT
REGISTERED IN SUBSEQUENT SEMESTERS

	Fal86	Spr87	Fal87	Spr88	Fal88
Course Load = 1					
Taking tech-occ	100	29.4	18.1	13.0	10.8
Not taking t-o	100	35.6	21.0	16.8	14.0
Taking develop	100	42.2	24.4	22.9	15.9
Not taking dev	100	32.0	19.3	14.4	12.3
Course Load = 2-3					
Taking tech-occ	100	50.8	31.0	24.5	18.1
Not taking t-o	100	56.3	37.9	31.1	24.5
Taking develop	100	56.3	37.8	30.8	24.8
Not taking dev	100	52.9	33.7	27.1	20.5
Course Load = 4+					
Taking tech-occ	100	71.6	47.8	38.9	26.7
Not taking t-o	100	75.7	51.5	43.7	28.5
Taking develop	100	76.0	52.7	44.3	31.2
Not taking dev	100	72.4	47.8	39.7	24.9

Fig. 3

three course load groupings students who registered for a developmental course in their initial semester persisted at higher rates than those that did not. Note also that students who did not register for a technical-occupational course persisted at higher rates than those who did. This pattern is replicated across the three load groupings. However, the most interesting and startling pattern is that there is no overlap in persistence rates from one course load grouping to the next. Similar patterns

were found when persistence was plotted with respect to course load and other variables (e.g., age). Clearly, a major variable with respect to subsequent persistence is initial course load. Therefore, it made sense to incorporate this variable in the typology.

At the outset of our deliberations we decided that a key part of the typology would be students' stated intentions. Obviously, if student success is defined as achievement of goals, knowing what those goals are becomes of paramount importance. A difficulty that we at the DCCCD had with respect to student goals is that prior to Fall 1989 this information was not collected in the same way on all of the DCCCD's constituent colleges, precluding any retrospective longitudinal analysis. This situation was corrected in Fall 1989 when a new registration system was introduced which incorporated student goal data. Figure 4 summarizes student goals for the 1989 cohort. For the

DCCCD 1989 COHORT STUDENT INTENTION

	Number	Percent
Degree	1,551	12.2
Certificate	238	1.9
Transfer	4,427	34.8
Job related*	1,012	8.0
Personal enrichment	43	0.3
Unsure	1,307	10.3
Unknown**	4,134	32.5
Total	12,712	100.0

* Not interested in earning a degree/certificate or transferring to a four year college

** Neither indicated specific goal nor uncertainty about goals

Fig. 4

purposes of the typology we decided that these were too many categories. It will be recalled that one of the conditions which the typology must satisfy is that it be manageable. Therefore, in order to lessen the number of possible types in the typology, we collapsed a number of related goal categories (see Figure 5).

DCCCD 1989 COHORT STUDENT INTENTION (COLLAPSED CATEGORIES)

	Number	Percent
Degree/Cert./Trans.	6,216	48.9
Job related	1,012	8.0
Personal enrichment	43	0.3
Unsure/Unknown	5,441	42.8
Total	12,712	100.0

Fig. 5

The rationale for combining categories is as follows. Degrees, certificates, and transfer to four year colleges represent academic goals. That is, the student must meet certain academic standards (e.g., maintaining a 2.0 GPA) in order to achieve them. Job related goals, in contrast, do not necessarily require the meeting of academic standards in order to be accomplished. If one, for example, takes a COBOL class to enhance his or her job performance, the grade the student gets in that class is immaterial to the objective. What is important is that what the student learned in the class will be useful on the job. "Unsure" and "unknown" were collapsed because it was felt that both these categories were indicative of a decreased social integration (see Tinto (1987)) from the collegiate process on the part of the student. Indeed, "unknowns" are not randomly

distributed across the cohort but are concentrated among people under 20 and over 45 and among people with a course load of 1.

It makes intuitive sense to include age as a significant variable in the typology. Obviously, the needs and desires of an 18 year old are likely to be very different from those of a 50 year old. However, since we as yet had no longitudinal information with respect to age, intention, and persistence (see above), it was decided to hold this variable in abeyance for at least a year until more data was collected.

The Typology

Thus the typology would be constructed out of two key variables: initial course load and stated intention. A simple two-dimensional matrix, with each variable on an axis, was constructed, yielding twelve types (see Figure 6). In order to

		COURSE LOAD		
		1 (1)	2 (2-3)	3 (4+)
INTENTION	A. Cert/deg/trans	1A	2A	3A
	B. Job related	1B	2B	3B
	C. Pers interest	1C	2C	3C
	D. Unsure/unknown	1D	2D	3D

Fig. 6

insure the typology be as value neutral as possible, it was decided to name each type according to its place in the matrix

(i.e., 1A, 3B, etc.). The distribution among types is summarized in Figure 7. As we can see, and perhaps surprisingly, the largest

DCCCD TYPOLOGY DISTRIBUTION

FALL 1989 COHORT

	Number	Percent
1A	1,093	8.6
1B	521	4.1
1C	25	0.2
1D	2,142	16.9
2A	2,117	16.7
2B	343	2.7
2C	13	0.1
2D	1,920	15.1
3A	2,924	23.0
3B	127	1.0
3C	13	0.1
3D	1,475	11.6
TOTAL	12,712	100.0

Fig. 7

single type is 3A, full-time degree-, certificate-, or transfer-oriented students. Another surprise was the small numbers of people falling into job-related and personal interest types, at all three course load levels (1B, 2B, 3B, and 1C, 2C, 3C)[4].

Now the most difficult part of this enterprise is faced: defining success criteria for each type. This required that we make explicit the institution's educational values; what are the student outcomes that are most important for the institution? Early on, we decided that our success criteria would apply not to the behavior of individual students but to aggregates of them. The emphasis is not on judging students but on judging the

institution with respect to those students. Figures 8-10 show the success criteria defined for each type. The "Actual" column

DCCCD STUDENT SUCCESS CRITERIA AND TYPE BEHAVIOR

FALL 1989 COHORT

COURSE LOAD = 1 COURSE

TYPE	SUCCESS INDICATORS	ACTUAL	TARGET RANGE
1A	COMPLETION OF COURSE WITH C OR BETTER	63.7	66.9-70.1
	PERCENT OF STUDENTS RECEIVING W	18.2	18.0-17.5
	PERSISTENCE TO NEXT LONG SEMESTER	38.6	40.5-42.5
1B	COMPLETION OF COURSE WITH C OR BETTER	61.5	64.6-67.7
	PERCENT OF STUDENTS RECEIVING W	15.7	15.5-15.1
	PERSISTENCE TO NEXT LONG SEMESTER	18.6	19.5-20.5
1C	COMPLETION OF COURSE WITH C OR BETTER	47.4	49.8-52.1
	PERCENT OF STUDENTS RECEIVING W	42.1	40.0-37.9
	MET PERCEIVED NEEDS	80.0*	84.0-88.0
1D	COMPLETION OF COURSE WITH C OR BETTER	65.8	69.1-72.4
	PERCENT OF STUDENTS RECEIVING W	17.0	16.8-16.3
	PERSISTENCE TO NEXT LONG SEMESTER	27.2	28.6-29.9
	CLARIFICATION OF GOALS OF RETURNEES	54.8	57.5-60.3

* Indicates estimate based on extrapolations from known data. As the actual figures come in they will be incorporated in the table and target ranges adjusted accordingly.

Fig. 8

shows what the percentage rate for each student type in each success indicator. For example, in type 1A, under the indicator "Completion of Course with C or Better", 63.7% of the 1A's of the Fall 1989 cohort completed their course (remember, they were only registered for one course) with at least a C. The "Target Range" column is a first step at affixing some kind of goals for improving student success. The figures in that column represent

DCCCD STUDENT SUCCESS CRITERIA AND TYPE BEHAVIOR

FALL 1989 COHORT

COURSE LOAD = 2-3 COURSES

TYPE	SUCCESS INDICATORS	ACTUAL	TARGET RANGE
2A	COMPLETION OF ALL COURSES WITH C OR BETTER	43.6	45.8-48.0
	PERCENT OF STUDENTS RECEIVING W	32.8	32.4-31.5
	PERSISTENCE TO NEXT LONG SEMESTER	49.5	52.0-54.5
	TRANSFER OR COMPLETION OF DEGREE/ CERTIFICATE WITHIN 5 YEARS	15.0*	15.8-16.5*
2B	COMPLETION OF ALL COURSES WITH C OR BETTER	56.2	59.0-61.8
	PERCENT OF STUDENTS RECEIVING W	22.5	22.2-21.6
	PERSISTENCE TO NEXT LONG SEMESTER	44.7	46.9-49.2
	MOVEMENT TO DEGREE/CERTIFICATE TRACK	24.6	25.8-27.1
	MET NEEDS OF EMPLOYERS	80.0*	84.0-88.0*
2C	COMPLETION OF ALL COURSES WITH C OR BETTER	35.7	37.5-39.3
	PERCENT OF STUDENTS RECEIVING W	42.9	40.8-38.6
	MET PERCEIVED NEEDS	80.0*	84.0-88.0*
2D	COMPLETION OF ALL COURSES WITH C OR BETTER	52.2	54.8-57.4
	PERCENT OF STUDENTS RECEIVING W	27.4	27.1-26.3
	PERSISTENCE TO NEXT LONG SEMESTER	57.1	60.0-62.8
	CLARIFICATION OF GOALS OF RETURNEES	65.9	69.2-72.5

* See Figure 8

Fig. 9

desired increases (or in the case of students receiving W grades, decreases) in the actual percentages after one year[6]. These targets, as well as the methodology for determining them will be subject to continual refinement, as new data become available.

In formulating the success indicators, we decided that a number of values would underlie the success model. In the first place, we felt that it is important that students perform at least a C level. Conversely, in spite of the fact that they have

DCCCD STUDENT SUCCESS CRITERIA AND TYPE BEHAVIOR

FALL 1989 COHORT

COURSE LOAD = 4+ COURSES

TYPE	SUCCESS INDICATORS	ACTUAL	TARGET RANGE
3A	COMPLETION OF ALL COURSES WITH C OR BETTER	34.7	36.4-38.2
	PERCENT OF STUDENTS RECEIVING W	45.4	43.1-40.9
	PERSISTENCE TO NEXT LONG SEMESTER	74.6	75.5-77.6
	TRANSFER OR COMPLETION OF DEGREE/ CERTIFICATE WITHIN 3 YEARS	25.0*	26.8-27.5*
3B	COMPLETION OF ALL COURSES WITH C OR BETTER	56.0	58.8-61.6
	PERCENT OF STUDENTS RECEIVING W	28.8	28.5-27.6
	PERSISTENCE TO NEXT LONG SEMESTER	76.0	76.9-79.0
	MOVEMENT TO DEGREE/CERTIFICATE TRACK	48.9	51.3-53.8
	COMPLETER WITHING 2 YEARS	60.0*	63.0-66.0
3C	COMPLETION OF ALL COURSES WITH C OR BETTER	60.0	63.0-66.0
	PERCENT OF STUDENTS RECEIVING W	20.0	19.8-19.2
	PERSISTENCE TO NEXT LONG SEMESTER	60.0	63.0-66.0
	MET PERCEIVED NEEDS	80.0*	84.0-88.0*
3D	COMPLETION OF ALL COURSES WITH C OR BETTER	41.9	44.0-46.1
	PERCENT OF STUDENTS RECEIVING W	39.8	37.8-35.8
	PERSISTENCE TO NEXT LONG SEMESTER	75.0	75.9-78.0
	CLARIFICATION OF GOALS OF RETURNEES	73.6	74.5-76.5

* See Figure 8

Fig. 10

no negative impact on students' grade point averages, students should be encouraged not to take Ws. Another value is the importance placed on persistence to the next long semester, and ultimately to graduation or transfer. Still another is that the community college has an obligation to help students who have not done so to clarify their goals. That is why for all "unknown/unsure" students (1D, 2D, 3D) we want to know what

percentage of those who persisted clarified their goals. And we want to increase that percentage.

The success model presented here establishes under what circumstances we will take a student's word at face value and under which circumstances we will not. Note that for type 1A (Figure 8) there is no success indicator which refers to completion of a degree or certificate or to transfer to a four year college. We felt that given the extremely low persistence rates of students who register for one course in their initial semester, it is unrealistic to expect significant numbers of these to graduate or transfer, irrespective of their stated intentions. Likewise, satisfaction of perceived needs as a success indicator only becomes significant if a student indicates certain nonacademic intentions (e.g., personal interest). Looking at community college student success in this way represents a radical departure from most conceptualizations which unfalteringly take a student's word at face value ("If the student was satisfied, then it was a successful experience.")[7].

Some Concluding Comments

A full discussion of the numerous implications of the success model presented above is outside the scope of this paper. However, we can briefly mention some of them. First, this model represents an attempt to come to terms with the diversity of needs and abilities of community college students. In so doing it seeks to rigorously define what a community college expects of itself with respect to its students.

The typology puts the whole discussion of at risk students in a new light. If, for example, we wish to define "at risk" as a high probability of not meeting stated goals, then our 1A students are definitely at risk. Note that the discussion of at-risk students becomes one based on data, not on impressions or prejudices (e.g., equating at risk and minority students).

The model should not be seen as an institutional report card. Rather, it should be seen as a set of gauges which show the aggregate behavior of students in great detail. This allows administrators to allocate scarce resources to where they are most needed.

For institutional researchers, the methodologies described here can be replicated at their own institutions. I do not mean that the typology as such be replicated, but the way in which the typology was formulated. Although I am led to believe that the typology does reflect some generic process in the community college (e.g., the relationship between initial course load and subsequent persistence), there is not yet enough cross-institutional data to make an unequivocal determination along those lines. For the moment, the model presented here is simply offered as a way for us to get a better understanding of our student body and to get a more subtle understanding of student outcomes.

Notes

1. For students' income we used mean income of their zip code zone as a proxy.

2. For nominal variables such as race/ethnicity and sex, we created dummy numeric variables. Thus race was subdivided into four variables: white, black, Hispanic, and Asian. Each of these variables had two possible values: 1 and 0. If a student was classified as Asian, for example, the values for the race/ethnicity dummies for that student would be as follows: white=0, black=0, Hispanic=0, Asian=1. Correlations would then be calculated using the dummy variables.

3. Percentages do not add up to a hundred because of rounding errors.

4. Because of a programming error many people reporting "personal interest" during Fall 1989 registration were instead classified as "unknown". This problem was corrected for the Spring 1990 registration, yielding a more accurate count. Spring 1990 data show that although people in personal interest types were greater in number than shown in Figure 7, they only accounted for just over 3%, across all course load levels, of that cohort.

5. As in many other institutions, a W grade indicates that the student withdrew from the class by the withdrawal deadline (about the middle of the semester). At the DCCCD Ws do not affect a student's grade point average.

6. The increases and decreases were calculated according to the following formula. If the base percentage was over 67% then the target range would represent an increase of 1.2% to 4%. If the base percentage was less than or equal to 67% then the target range would represent an increase of 5% to 10%. The exception to this formula is for calculating target ranges for students receiving Ws. In that case, if the base percentage is less than 37% then the target range represents a <u>decrease</u> of 1.2% to 4%. If it is more than or equal to 37% then the target range is a decrease of 5% to 10%.

7. In this context, it is interesting to note that of the thousand-odd 1A students, approximately 200 of them indicated that they wanted to earn an associate degree and that they expected to earn it in <u>two years</u>! At the rate of one course per semester, it would take on the order of ten years to earn a "two year" degree. So much for taking a student's word at face value.

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